Specification Page 1 of 1

The City of Winnipeg Tender No. 18-2024

Template Version: eC2023 07 27 - Const Road Works

APPENDIX 'A' - GEOTECHNICAL REPORT

GEOTECHNICAL REPORTS FOR:

Brock Street from Mathers Avenue to Taylor Avenue – Asphalt Pavement Reconstruction Edderton Avenue from Beaumont Street to Derek Street – Asphalt Pavement Reconstruction Rosemount Avenue from Beaumont Street to Derek Street – Asphalt Pavement Reconstruction

PAVEMENT CORES FOR:

Brock Street from Mathers Avenue to Taylor Avenue – Asphalt Pavement Reconstruction Queenston Bay – West Leg from Mathers Avenue to Brock Street – Concrete Pavement Rehabilitation

The geotechnical report is provided to aid in the Contractor's evaluation of the existing pavement structure and/or soil conditions. The information presented is considered accurate at the locations shown on the Drawings and at the time of drilling. However, variations in pavement structure and/or soil conditions may exist between test holes and fluctuations in groundwater levels can be expected seasonally and may occur as a result of construction activities. The nature and extent of variations may not become evident until construction commences.



Stantec Consulting Ltd. 199 Henlow Bay Winnipeg MB R3Y 1G4

February 21, 2024

Project/File: 123316853

Richard Weibel City of Winnipeg 106, 1155 Pacific Avenue Winnipeg, MB R3E 3P1

Good day Richard,

Reference: 2024 Local Street Renewals Program (Contract 1)

Stantec Consulting Ltd. (Stantec) was retained to undertake a factual geotechnical investigation for the 2024 Local Street Renewals Program (Contract 1) in Winnipeg, Manitoba. Use of this report is subject to the Statement of General Conditions provided in **Appendix A**.

The subsurface coring and drilling sampling program was conducted from December 1, 2023, to January 24, 2024. Pavement coring was performed by our geotechnical field personnel, and drilling services were provided by Paddock Drilling under the supervision of our personnel. The borehole locations are shown on the attached Borehole Location Plan provided in **Appendix B**. When subsurface drilling was required, the pavement cores were sampled with a 150 mm bit and boreholes were drilled with 125 mm solid stem augers. Geotechnical drilling boreholes were terminated at a depth of 2.0 m below the pavement, which resulted in borehole depths ranging from 2.05 m to 2.40 m below the surface. Soil samples were obtained directly from the auger flights at depths of 0.6 m, 0.9 m, 1.2 m, 1.6 m, and 2.0 m from the bottom of the existing pavement. Upon completion of drilling, the testholes were examined for evidence of sloughing and groundwater seepage. The borehole records are provided in **Appendix C**. The soil classification used in the borehole records is as per ASTM D2487 – *Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)*. Core photographs are provided in **Appendix D**.

Reference: 2024 Local Street Renewals Program (Contract 1)

EXISTING PAVEMENT THICKNESS

The existing pavement thickness is provided in the following table:

Street	Core ID	Asphalt Thickness (mm)	Concrete Thickness (mm)	Total Pavement Thickness (mm)
Brock Street	1	0	200	200
Brock Street	2	0	200	200
Brock Street	3	0	200	200
Brock Street	4	0	200	200
Queenston Bay	5	0	170	170
Queenston Bay	6	0	180	180
Queenston Bay	7	0	180	180
Edderton Ave	8	40	0	40
Edderton Ave	9	40	0	40
Edderton Ave	10	50	0	50
Edderton Ave	11	50	0	50
Rosemount Ave	12	100	0	100
Rosemount Ave	13	50	0	50
Rosemount Ave	14	50	0	50
Rosemount Ave	15	50	0	50

LABORATORY TESTING

The following laboratory tests were conducted on select soil samples:

- ASTM D2216 Laboratory Determination of Water (Moisture) Content of Soil by Mass
- ASTM D4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils
- ASTM D7928 Particle-Size Distribution of Fine-Grained Soils Using The Sedimentation Analysis
- ASTM D698 Laboratory Compaction Characteristics of Soil Using Standard Effort
- ASTM D1883 California Bearing Ratio (CBR) of Laboratory-Compacted Soils
- CSA A23.2-14C Obtaining and testing drilled cores for compressive strength testing

The CBR tests were performed at 95% maximum dry density under soaked conditions. Prior to testing the concrete core samples for compressive strength, the cores were conditioned in water at room temperature for 48 hours. The moisture content results are shown on the borehole records, and the laboratory test reports are provided in **Appendix E**.

We appreciate the opportunity to assist you on this project. Please contact the undersigned if you have any questions regarding this report.

Reference: 2024 Local Street Renewals Program (Contract 1)

Regards,

STANTEC CONSULTING LTD.

Guillaume Beauce P.Eng.

Geotechnical Engineer, Materials Testing Services

Phone: 204-928-7618 Mobile: 204-898-8290

guillaume.beauce@stantec.com

Jason Thompson C.E.T.

Manager, Materials Testing Services

Phone: 204-928-4004 Mobile: 204-981-8445 jason.thompson@stantec.com

Attachment: Appendix A – Statement of General Conditions

Appendix B – Borehole Location Plan Appendix C – Borehole Records Appendix D – Core Photographs Appendix E – Laboratory Test Reports

Atterberg Limits Test Reports

- Particle-Size Analysis Reports
- Standard Proctor Test Reports
- CBR Test Reports
- Concrete Core Compressive Strength Test Results

APPENDIX A

Statement of General Conditions

STATEMENT OF GENERAL CONDITIONS

USE OF THIS REPORT: This report has been prepared for the sole benefit of the Client or its agent and may not be used by any third party without the express written consent of Stantec and the Client. Any use which a third party makes of this report is the responsibility of such third party.

BASIS OF THE REPORT: The information, opinions, and/or recommendations made in this report are in accordance with Stantec's present understanding of the site-specific project as described by the Client. The applicability of these is restricted to the site conditions encountered at the time of the investigation or study. If the proposed site-specific project differs or is modified from what is described in this report or if the site conditions are altered, this report is no longer valid unless Stantec is requested by the Client to review and revise the report to reflect the differing or modified project specifics and/or the altered site conditions.

STANDARD OF CARE: Preparation of this report, and all associated work, was carried out in accordance with the normally accepted standard of care in the state or province of execution for the specific professional service provided to the Client. No other warranty is made.

INTERPRETATION OF SITE CONDITIONS: Soil, rock, or other material descriptions, and statements regarding their condition, made in this report are based on site conditions encountered by Stantec at the time of the work and at the specific testing and/or sampling locations. Classifications and statements of condition have been made in accordance with normally accepted practices which are judgmental in nature; no specific description should be considered exact, but rather reflective of the anticipated material behavior. Extrapolation of in situ conditions can only be made to some limited extent beyond the sampling or test points. The extent depends on variability of the soil, rock, and groundwater conditions as influenced by geological processes, construction activity, and site use.

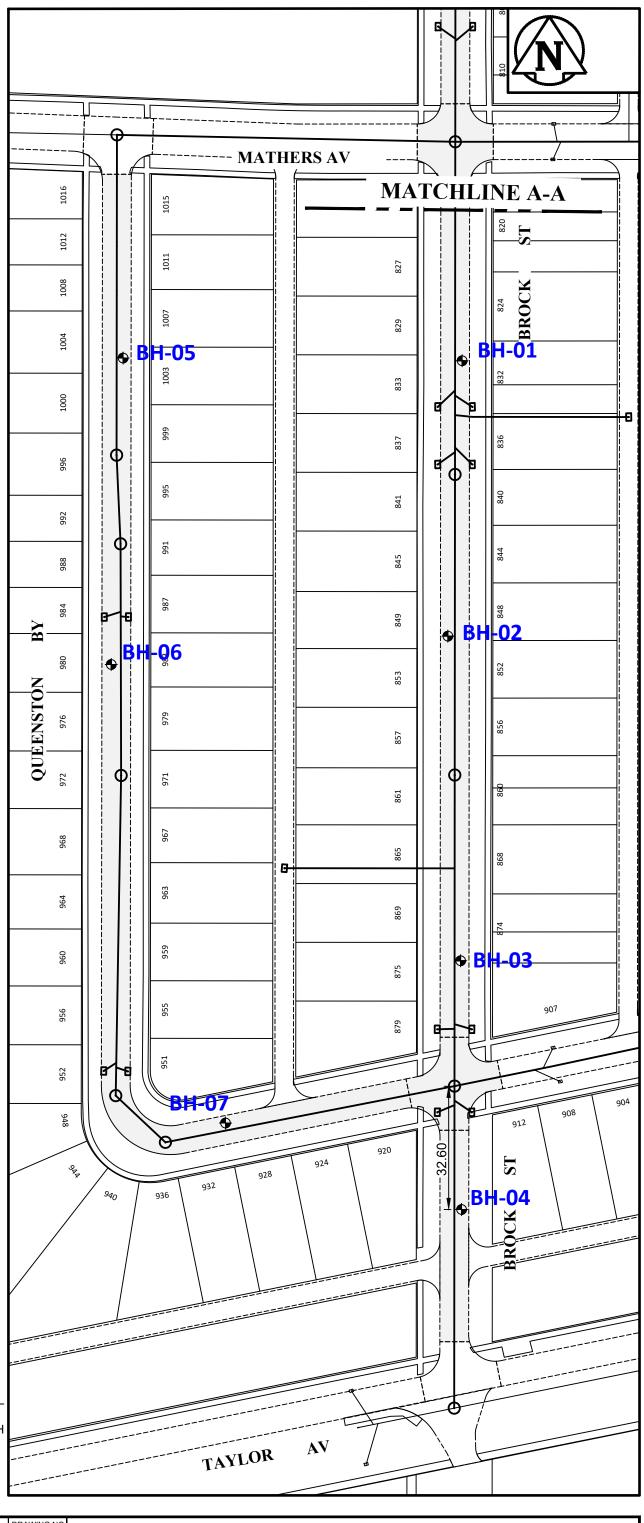
VARYING OR UNEXPECTED CONDITIONS: Should any site or subsurface conditions be encountered that are different from those described in this report or encountered at the test locations, Stantec must be notified immediately to assess if the varying or unexpected conditions are substantial and if reassessments of the report conclusions or recommendations are required. Stantec will not be responsible to any party for damages incurred as a result of failing to notify Stantec that differing site or sub-surface conditions are present upon becoming aware of such conditions.

PLANNING, DESIGN, OR CONSTRUCTION: Development or design plans and specifications should be reviewed by Stantec, sufficiently ahead of initiating the next project stage (property acquisition, tender, construction, etc.), to confirm that this report completely addresses the elaborated project specifics and that the contents of this report have been properly interpreted. Specialty quality assurance services (field observations and testing) during construction are a necessary part of the evaluation of sub-subsurface conditions and site preparation works. Site work relating to the recommendations included in this report should only be carried out in the presence of a qualified geotechnical engineer; Stantec cannot be responsible for site work carried out without being present.



APPENDIX B

Borehole Location Plan



NOTE:

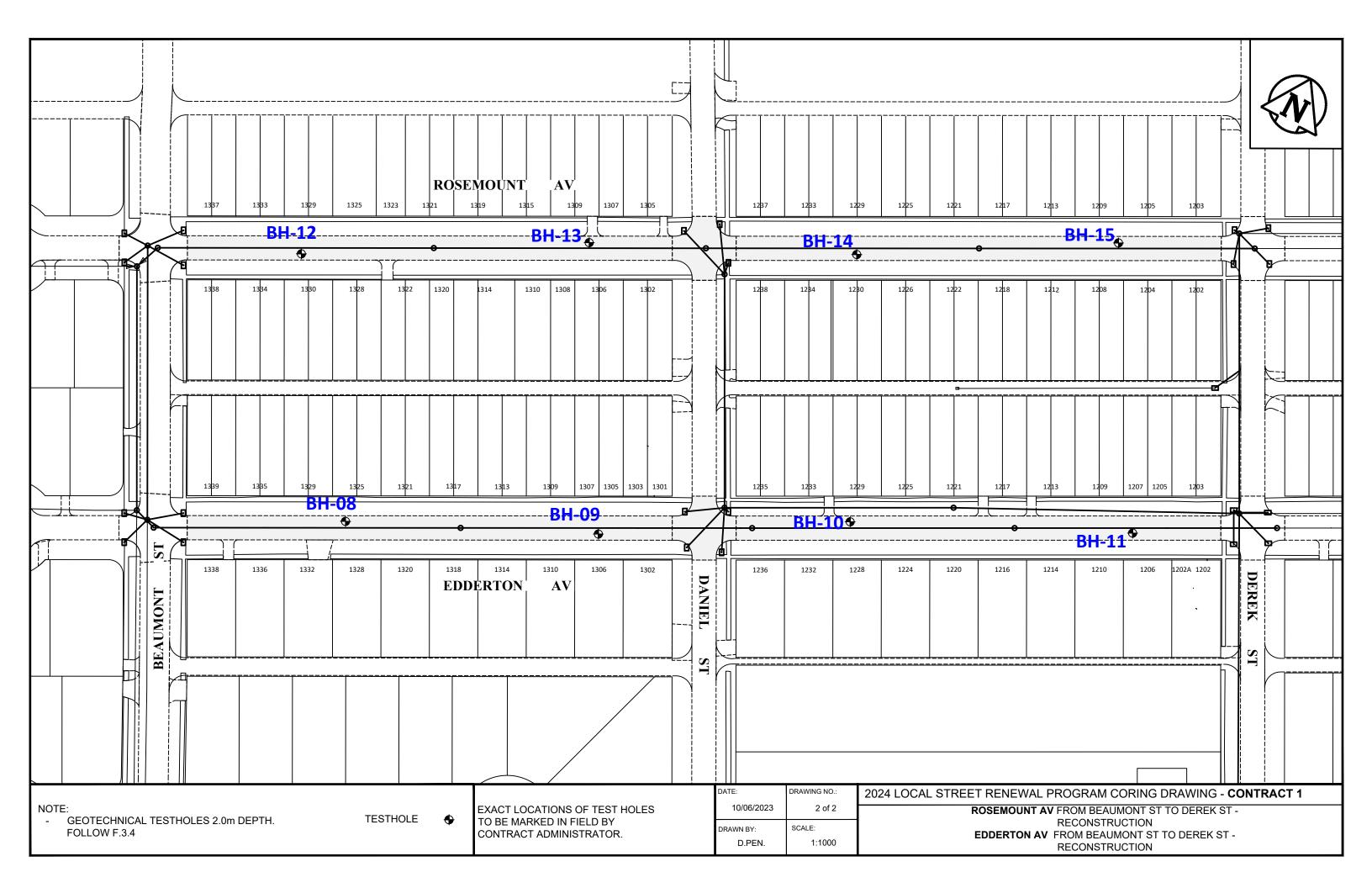
- BROCK ST = FULL DEPTH GEOTECHNICAL CORES. FOLLOW (J) LABRATORY TEST PROGRAMS FOR ALL
- CORES.

 QUEENSTON = DRILL PAVEMENT CORE ONLY EACH TEST HOLE LOCATION

TESTHOLE



EXACT LOCATIONS OF TEST HOLES	DATE:	DRAWING NO.	2024 LOCAL STREET RENEWAL PROGRAM CORING DRAWING - CONTRACT 1
TO BE MARKED IN FIELD BY	09/28/2023	1 of 2	BROCK ST FROM GRANT AV TO TAYLOR AV - RECONSTRUCTION
CONTRACT ADMINISTRATOR.	DRAWN BY: D.PEN.	SCALE: N.T.S.	QUEENSTON BY FROM MATHERS AV TO BROCK ST - MINOR REHAB



APPENDIX C

Borehole Records

SYMBOLS AND TERMS USED ON BOREHOLE AND TEST PIT RECORDS

SOIL DESCRIPTION

Terminology describing common soil genesis:

Rootmat	 vegetation, roots and moss with organic matter and topsoil typically forming a mattress at the ground surface
Topsoil	- mixture of soil and humus capable of supporting vegetative growth
Peat	- mixture of visible and invisible fragments of decayed organic matter
Till	- unstratified glacial deposit which may range from clay to boulders
Fill	- material below the surface identified as placed by humans (excluding buried services)

Terminology describing soil structure:

Desiccated	- having visible signs of weathering by oxidization of clay minerals, shrinkage cracks, etc.
Fissured	- having cracks, and hence a blocky structure
Varved	- composed of regular alternating layers of silt and clay
Stratified	- composed of alternating successions of different soil types, e.g. silt and sand
Layer	- > 75 mm in thickness
Seam	- 2 mm to 75 mm in thickness
Parting	- < 2 mm in thickness

Terminology describing soil types:

The classification of soil types are made on the basis of grain size and plasticity in accordance with the Unified Soil Classification System (USCS) (ASTM D 2487 or D 2488) which excludes particles larger than 75 mm. For particles larger than 75 mm, and for defining percent clay fraction in hydrometer results, definitions proposed by Canadian Foundation Engineering Manual, 4th Edition are used. The USCS provides a group symbol (e.g. SM) and group name (e.g. silty sand) for identification.

Terminology describing cobbles, boulders, and non-matrix materials (organic matter or debris):

Terminology describing materials outside the USCS, (e.g. particles larger than 75 mm, visible organic matter, and construction debris) is based upon the proportion of these materials present:

Trace, or occasional	Less than 10%
Some	10-20%
Frequent	> 20%

Terminology describing compactness of cohesionless soils:

The standard terminology to describe cohesionless soils includes compactness (formerly "relative density"), as determined by the Standard Penetration Test (SPT) N-Value - also known as N-Index. The SPT N-Value is described further on page 3. A relationship between compactness condition and N-Value is shown in the following table.

Compactness Condition	SPT N-Value
Very Loose	<4
Loose	4-10
Compact	10-30
Dense	30-50
Very Dense	>50

Terminology describing consistency of cohesive soils:

The standard terminology to describe cohesive soils includes the consistency, which is based on undrained shear strength as measured by *in situ* vane tests, penetrometer tests, or unconfined compression tests. Consistency may be crudely estimated from SPT N-Value based on the correlation shown in the following table (Terzaghi and Peck, 1967). The correlation to SPT N-Value is used with caution as it is only very approximate.

Consistency	Undrained Sh	Approximate					
Consistency	kips/sq.ft.	kPa	SPT N-Value				
Very Soft	<0.25	<12.5	<2				
Soft	0.25 - 0.5	12.5 - 25	2-4				
Firm	0.5 - 1.0	25 - 50	4-8				
Stiff	1.0 - 2.0	50 – 100	8-15				
Very Stiff	2.0 - 4.0	100 - 200	15-30				
Hard	>4.0	>200	>30				

STRATA PLOT

Strata plots symbolize the soil or bedrock description. They are combinations of the following basic symbols. The dimensions within the strata symbols are not indicative of the particle size, layer thickness, etc.























Boulders Cobbles Gravel

Clay

Organics Asphalt

Igneous Bedrock morphic Bedrock

Sedimentary Bedrock

SAMPLE TYPE

SS	Split spoon sample (obtained by performing the Standard Penetration Test)					
ST	Shelby tube or thin wall tube					
D.B.	Direct-Push sample (small diameter tube					
DF	sampler hydraulically advanced)					
PS	Piston sample					
BS	Bulk sample					
HQ, NQ, BQ, etc.	Rock core samples obtained with the use					
TIQ, NQ, BQ, EIC.	of standard size diamond coring bits.					

WATER LEVEL MEASUREMENT



measured in standpipe, piezometer, or well



inferred

RECOVERY

For soil samples, the recovery is recorded as the length of the soil sample recovered. For rock core, recovery is defined as the total cumulative length of all core recovered in the core barrel divided by the length drilled and is recorded as a percentage on a per run basis.

N-VALUE

Numbers in this column are the field results of the Standard Penetration Test: the number of blows of a 140 pound (63.5 kg) hammer falling 30 inches (760 mm), required to drive a 2 inch (50.8 mm) O.D. split spoon sampler one foot (300 mm) into the soil. In accordance with ASTM D1586, the N-Value equals the sum of the number of blows (N) required to drive the sampler over the interval of 6 to 18 in. (150 to 450 mm). However, when a 24 in. (610 mm) sampler is used, the number of blows (N) required to drive the sampler over the interval of 12 to 24 in. (300 to 610 mm) may be reported if this value is lower. For split spoon samples where insufficient penetration was achieved and N-Values cannot be presented, the number of blows are reported over sampler penetration in millimetres (e.g. 50/75). Some design methods make use of N-values corrected for various factors such as overburden pressure, energy ratio, borehole diameter, etc. No corrections have been applied to the N-values presented on the log.

DYNAMIC CONE PENETRATION TEST (DCPT)

Dynamic cone penetration tests are performed using a standard 60 degree apex cone connected to 'A' size drill rods with the same standard fall height and weight as the Standard Penetration Test. The DCPT value is the number of blows of the hammer required to drive the cone one foot (300 mm) into the soil. The DCPT is used as a probe to assess soil variability.

OTHER TESTS

S	Sieve analysis
Н	Hydrometer analysis
k	Laboratory permeability
Υ	Unit weight
Gs	Specific gravity of soil particles
CD	Consolidated drained triaxial
CU	Consolidated undrained triaxial with pore
CU	pressure measurements
UU	Unconsolidated undrained triaxial
DS	Direct Shear
С	Consolidation
Qυ	Unconfined compression
	Point Load Index (Ip on Borehole Record equals
Ιp	I_p (50) in which the index is corrected to a
	reference diameter of 50 mm)

Ţ	Single packer permeability test; test interval from depth shown to bottom of borehole
	Double packer permeability test; test interval as indicated
, o	Falling head permeability test using casing
Y	Falling head permeability test using well point or piezometer

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		Soft tan lean CLAY (CL) Firm brown fat CLAY (CH)																		
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		ON: Edderton Avenue	ais							DATUM:	
		ORED: <u>January 08 2024</u>							_ WATER LEVEL: N/A	ATOM. Turk	
DЕРТН (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	1	N-VALUE or RQD %	OTHER TESTS / REMARKS	UNDRAINED SHEAR STRENGTH, Cu ▲ LABORATORY TEST ◆ F ★ POCKET PENETROMETER □ F	PIELD VANE TEST POCKET SHEAR VANE 150 kPa 200 kPa	BACKFILL
0 -						~			Water Content (%) and Blow C	ount 60 70 80	
-		ASPHALT FILL: crushed limestone, 19 mm maximum aggregate size									
_		Soft tan lean CLAY (CL) with sand									-
-				X AS				Sieve/Hydro at 0.7 m G S M C 4% 23% 24% 49%	1-9		
1 -				AS							
-				AS					φ.		
-		Firm brown fat CLAY (CH) - silty, sandy, trace gravel		X as					•		
2 -				X as					8		
-											
-		End of Borehole • Borehole terminated at a depth of 2.40 • No groundwater seepage or soil sloug • Borehole backfilled with auger cuttings • Borehole surface backfilled as per City	hing wa s and be	entonit	e chip	s.		•	illing.		-
3 -											-
_											-
-											-
4 -								Drilling Cont	ractor: Paddock Drilling Ltd	Loggad	By: CD
B∧∩'	KEIII	. SYMBOL M ASPHALT	GR		F.: *	1001	NCRE	Drilling Cont TE Drilling Meth		Logged Review	By: GP ed By: GI
اںہر		DNITE DRILL CUTTINGS	SAI		ĿÆ		UGH	Completion		Page	

PF	IENT	Stantec City of Winnipeg T:2024 Local Street Renew	als .					OLE RECOI	- -						Bł	l ELI	EVA ⁻	ΓΙΟΝ:	·	BH- 233168 N/A
		ON: Rosemount Avenue ORED: January 08 2024							_ \^/	ATER		т.	NI/		D/	ATUI	Λ: _	N/A		
DЕРТН (m)	ELEVATION (m)	ORED: January 08 2024 SOIL DESCRIPTION	, PLOT		SAMI		9	OTHER TESTS /	UNE	RAINE ABORA OCKET	D SH TOR	EAR S	TREN	IGTH	♦ FII	ELD V	T SHE	TEST EAR VA		FL
DEP	ELEVA	(MUSCS)	STRATA	TYPE	NUMBER	RECOVERY (mm) or TCR %	N-VALUE or RQD %	REMARKS		TER CO		BLOW Wate	S/0.3i	n : (%) and	Blow Cou	ınt	W _F	, w	W _L	BACKFILL
0 -		ASPHALT								0 2 ::::	<u>20</u> : :	30	_40 ::	<u> </u>	50 ::::	60 : : :	70 :: :	80 :::) :::::	
-		FILL: crushed limestone, 19 mm maximum aggregate size	D																	
-		Firm brown fat CLAY (CH) - silty, trace sand		V AS																
-				Ă AS				Sieve/Hydro at 0.7 m G S M C 0% 3% 38% 59%			1	Ģ							>>	
1 -				X AS																
-				X AS									\							
-				X as									Φ							
2 -				X as								/	/: : : : : : : : : : : : : : : : : : :							
-												Ø								
3 -		End of Borehole • Borehole terminated at a depth of 2.4 • No groundwater seepage or soil slou • Borehole backfilled with auger cutting • Borehole surface backfilled as per Ci	ghing wa	entonit	e chip	S.			illing.	**::: :	1::		, ; 1		4.::		, ; ! ;	-::·I	: i	
-																				
-																				
4 –								Drilling Cont	ractor	. pa	ıddo	ck Dri	lling	l td				Lor	nned	By: G
								Diming Con	iaciol	. га	uuU	ווט אכ	III IY	∟ıu.				100	yy c u	ву. G ed By:

PR	OJEC	City of Winnipeg CT: 2024 Local Street Renewa	ıls						_									вн	ELI	EVA	ATIC	DN: _		33168 N/A
LO	CATI	ON: Rosemount Avenue							_									DA	TUN	Λ : _	N/	Α		
DA	TE B	ORED: <u>January 17 2024</u>							_ W	۷A٦	TEF	R LE	VE	L:	N	/ A							_	
DEPTH (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	1	N-VALUE or RQD %	OTHER TESTS / REMARKS	▲ l	PO	BOR CKE	ATC T PI 50 kF	ORY TENET	TES ⁻	Г МЕТ 100	ENGT FER kPa	•	FIE PO(LD V CKET) kPa	T SH	IEAR 20	ST R VAN D0 kPa H W W	а	BACKFILL
	ᇤ		STI	Ĺ	Š	RECOV	2 P P							LOW	S/0.	ent (%) a	ind Blo	w Count		ı	 (0—1	i	ш
0 +		ASPHALT								_10) ::::	20 : :		30 : :	4	0 : : :	50		30 : :) ::::	80		
-		Firm brown fat CLAY (CH) - trace silt																						
1		Soft tan lean CLAY (CL) with sand		X as				Sieve/Hydro at 0.7 m						₹										
				X as				Sieve/Hydro at 0.7 m G S M C 0% 13% 52% 35%						\	6									
1 - - -				X as												b: ::								
-		Firm brown fat CLAY (CH)														\								
-				AS																				
2 -				AS											<u> </u>		<u>.</u>)						
-																								
-																								
3 -		End of Borehole Borehole terminated at a depth of 2.70 No groundwater seepage or soil slougl Borehole backfilled with auger cuttings Borehole surface backfilled as per City	ning wa and be	entonit	e chip	s. `		•	illing.	-														
1																								
-																								
, 1		1						Drilling Cont	racto	or.		adr	łock	. Dri	lling	a I to	1				T	Logg	l har	By: R
								Drinning Corn	uoic	OI.		auc	JOCIN		IIII IC	ց	ı.					LOUG	ica i	-y

DATE BORED: January 08 2024 WATER LEVEL: NA UNGRAINED SELECT STREAMSTH, Cu (offs) SOIL DESCRIPTION (MUSCs) SOIL DESCRIPTION (MUSCs) THE BORED SOIL DESCRIPTION (MUSCs) ASPHALT Finding and agregate size Firm to self-owner fall CLAY (CH) Thorace self-owner fall CLAY (CH) Thorace self-owner fall clay (CH) ARE ARE ARE ARE ARE ARE ARE ARE ARE AR	PROJE	Stantec T: City of Winnipeg ECT: 2024 Local Street Renew	als						- -							вн	ELE\	/ATIO	N:	BH 23316 N/A	853
SOIL DESCRIPTION (MUSCS) SOIL DESCRIPTION (MUSCS) SOIL DESCRIPTION (MUSCS) AS PARALT FILL: crushed limestone, 19 mm moximum aggregate size Firm to slift frown fall CLAY (CH) - trace slift AS AS AS AS AS AS AS AS AS AS									– W	ΔΤΕ	R I	F\/FI		N/A		DA	TUM:	N//	4		_
ASPHALT FILL crushed limestone, 19 mm minimum aggregate size Firm to stiff brown fat CLAY (CH) - trace sit AS AS AS AS Beverhydre at 0.7 m DS 354 3555 6154 Find of Borehole End of Borehole - Borehole eminated at a depth of 2.400 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. - Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.		SOIL DESCRIPTION		TYPE			N-VALUE or RQD %	OTHER TESTS / REMARKS	UNI	ABO POCK	NED RATO ET F 50 k	SHEADRY TO PENET Pa	T & AT	RENG ETER 00 kPa	TH, (FIEL POC 150	LD VAN CKET S KPa	SHEAR 200	VANE 0 kPa +	BACKFILL	
End of Borehole Borehole terminated at a depth of 2.400 m. No groundwater seepage or soil sloughing was observed during or upon completion of drilling. Borehole backfilled with auger cuttings and bentonite chips. Borehole surface backfilled as per City of Winnipeg Street Cuts Manual.	1 -	FILL: crushed limestone, 19 mm maximum aggregate size Firm to stiff brown fat CLAY (CH)	/\:``.	X AS				Sieve/Hydro at 0.7 m G S M C 0% 3% 36% 61%		10	20) 3	30	40				770	80		
Ι Ι	3 -	Borehole terminated at a depth of 2.4 No groundwater seepage or soil slow Borehole backfilled with auger cutting	ghing wa	entonit	e chip	OS.			illing.												

PR	OJE	CT: 2024 Local Street Renewa	als						_						ВІ	H EL	EVA	OIT	N:	23316 N/A
		ON: Rosemount Avenue							_						D	ATUI	M: _	N/A	١	
DA	TE B	ORED: <u>January 17 2024</u>							_				_: <u>_</u>							
DЕРТН (m)	ELEVATION (m)	SOIL DESCRIPTION (MUSCS)	STRATA PLOT	TYPE	NUMBER	_	N-VALUE or RQD %	OTHER TESTS / REMARKS	▲ L ★ F	ABC POCH	ORATO KET F 50 k	ORY T PENET Pa	T & AT	ETER 0 kPa TERBE 0.3m	□ PC 1! ERG LIN	ELD V DCKE 50 kPa H	T SH a	200	VANE) kPa 	BACKFILL
0 -		1001111				<u> </u>				10	20	3	Water Co	10 (%) ai	50	60	70)	30	
-		ASPHALT Firm black fat CLAY (CH)																		
- - - 1 –		Soft tan lean CLAY (CL)		Ă AS				Sieve/Hydro at 0.7 m G S M C 1% 6% 45% 46%				F	P							
-		Firm brown fat CLAY (CH)		AS							Ø									
- - - - 2 -				X AS																
				<u>Å</u> AS											8					
3		End of Borehole Borehole terminated at a depth of 2.70 No groundwater seepage or soil sloug Borehole backfilled with auger cuttings Borehole surface backfilled as per City	hing wa and be	entonit	e chip	s. `		•	: : :	::[:			L		:1:::	:11:				
₄								Drilling Cont	racto	r·	Dod	dool	Drillia	na I +d	1			Τ.	00000	I Rve - F
						_		Drilling Cont	ı acto	۱.	rad	uuck	ווווווט	ng Ltd	١.			+ -	oggeo	
۰ ۸	/EII 1	SYMBOL ASPHALT	. GR	OI 1T		CON	ICCC	TE Drilling Meth	uod.	12	5 mr	n SS	Δ						PVIP	ed By:

APPENDIX D

Core Photographs





Figure 1 – Core No. 1 (Brock St)



Figure 3 – Core No. 3 (Brock St)



Figure 2 – Core No. 2 (Brock St)

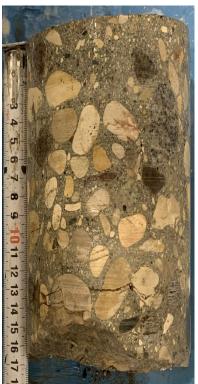


Figure 4 – Core No. 4 (Brock St)





Figure 5 – Core No. 5 (Queenston Bay)



Figure 7 – Core No. 7 (Queenston Bay)



Figure 6 – Core No. 6 (Queenston Bay)

APPENDIX E

Laboratory Test Reports



199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

PROJECT NO. 123316853

1

ATTN Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.15

Stantec Consulting Ltd. SUBA

DATE RECEIVED: 2024.Jan.15
SUBMITTED BY: Stantec Consulting Ltd.

DATE TESTED: 2024.Jan.25

TESTED BY: Co

Carson Cockwell

MATERIAL IDENTIFICATION

CLIENT FIELD ID

SAMPLED BY:

TRIAL

BLOWS

MC (%)

D BH-01, 1000 mm

LIQUID LIMIT

23

60

2

21

61

STANTEC SAMPLE NO. 2972

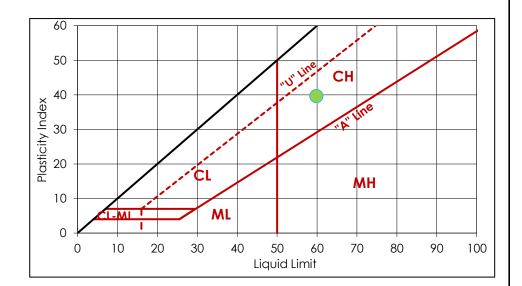
PLASTIC LIMIT

TRIAL

MC (%)

1 2 20 20 LIQUID LIMIT, LL
PLASTIC LIMIT, PL
PLASTICITY INDEX, PI
AS REC'D MC (%)

60 20 40 30,70



COMMENTS
No comments.

REPORT DATE 2024.Feb.05

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba R3E 3P1

PROJECT NO.

123316853

ATTN

SAMPLED BY:

TRIAL

BLOWS

MC (%)

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.15

28

62

DATE RECEIVED: 2024.Jan.15

DATE TESTED: 2024.Jan.25

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Carson Cockwell TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-02, 1000 mm

2973 STANTEC SAMPLE NO.

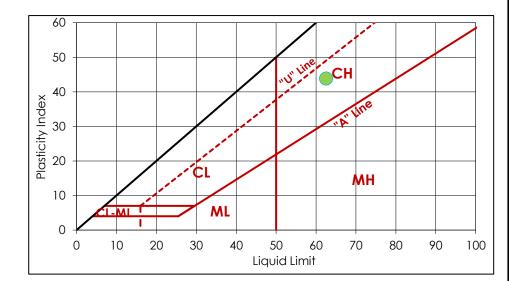
LIQUID LIMIT 2

27

61

PLASTIC LIMIT **TRIAL** 2 MC (%) 18 LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI AS REC'D MC (%)

63 19 44 41.80



COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1 PROJECT NO.

Richard Weibel **ATTN** REPORT NO. 3

DATE SAMPLED: 2024.Jan.15 DATE RECEIVED: 2024.Jan.15 DATE TESTED: 2024.Jan.25 Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. Carson Cockwell SAMPLED BY: TESTED BY:

MATERIAL IDENTIFICATION

TRIAL

BLOWS

MC (%)

CLIENT FIELD ID BH-03, 1000 mm

26

96

LIQUID LIMIT

STANTEC SAMPLE NO. 2974

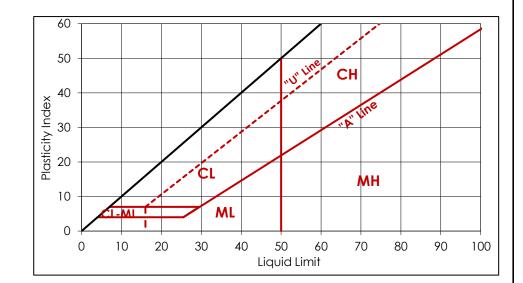
123316853

2 26

	PLASII	CLIMII
TRIAL	1	2
MC (%)	20	22

LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI AS REC'D MC (%)





COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Department

PROJECT

REPORT NO.

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1 PROJECT NO.

Richard Weibel **ATTN**

2

26

75

DATE SAMPLED: 2024.Jan.08 DATE RECEIVED: 2024.Jan.08 Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. SAMPLED BY:

DATE TESTED: 2024.Jan.15

Blair Dawson TESTED BY:

MATERIAL IDENTIFICATION

TRIAL

BLOWS

MC (%)

CLIENT FIELD ID BH-04, 1000 mm

25

LIQUID LIMIT

2941 STANTEC SAMPLE NO.

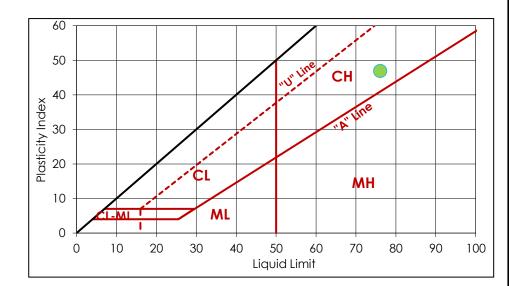
2

123316853

PLASTIC LIMIT **TRIAL** MC (%)

LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI AS REC'D MC (%)





COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba R3E 3P1

PROJECT NO.

123316853

ATTN

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.17

DATE RECEIVED: 2024.Jan.17

TRIAL

MC (%)

DATE TESTED: 2024.Jan.31

SAMPLED BY:

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-08, 640 mm

2

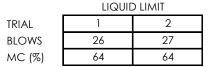
STANTEC SAMPLE NO.

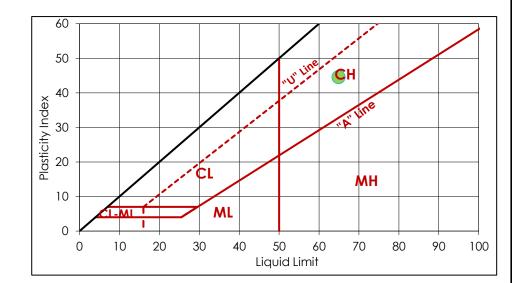
PLASTIC LIMIT

2996

LIQUID LIMIT, LL PLASTIC LIMIT, PL

PLASTICITY INDEX, PI AS REC'D MC (%)





COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba R3E 3P1

PROJECT NO.

123316853

ATTN

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.17

SAMPLED BY:

Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.17

MC (%)

DATE TESTED: 2024.Feb.01

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID

BH-09, 640 mm

2997 STANTEC SAMPLE NO.

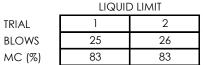
2

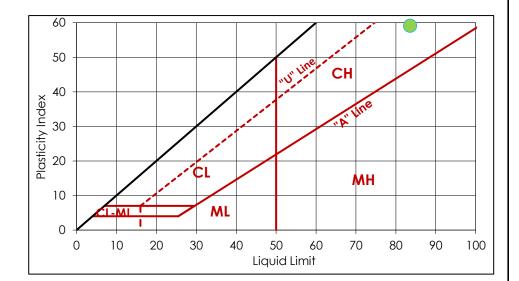
PLASTIC LIMIT **TRIAL**

LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI

AS REC'D MC (%)

24 59 34.90





COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba R3E 3P1

PROJECT NO.

123316853

ATTN

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.08 SAMPLED BY:

Stantec Consulting Ltd.

DATE RECEIVED: 2024.Jan.08

DATE TESTED: 2024.Jan.15

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Blair Dawson

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-10, 650 mm

2942 STANTEC SAMPLE NO.

7

LIQUID LIMIT

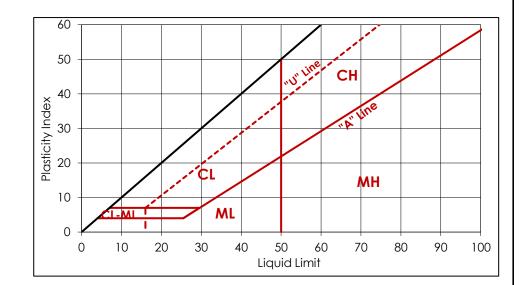
TRIAL **BLOWS** MC (%)

	=
1	2
27	28
86	85

PLASTIC LIMIT **TRIAL** 2 MC (%)

LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI AS REC'D MC (%)

24 62 32.98



COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

PROJECT NO.

123316853

ATTN

R3E 3P1

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.08 SAMPLED BY:

DATE RECEIVED: 2024.Jan.08

MC (%)

DATE TESTED: 2024.Jan.15

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Blair Dawson TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID

BH-11, 650 mm

2943 STANTEC SAMPLE NO.

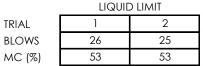
2

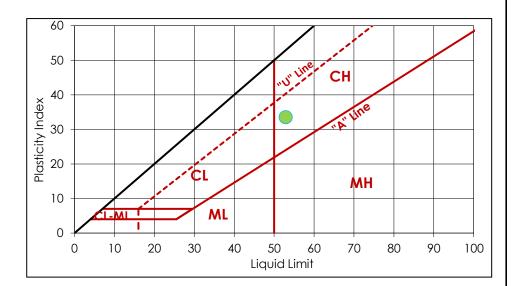
PLASTIC LIMIT **TRIAL**

LIQUID LIMIT, LL PLASTIC LIMIT, PL

PLASTICITY INDEX, PI AS REC'D MC (%)

19 33 24.94





COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba R3E 3P1

PROJECT NO.

123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.08 SAMPLED BY:

TRIAL

BLOWS

MC (%)

Stantec Consulting Ltd.

2

23

LIQUID LIMIT

DATE RECEIVED: 2024.Jan.08

DATE TESTED: 2024.Jan.15

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Blair Dawson

MATERIAL IDENTIFICATION

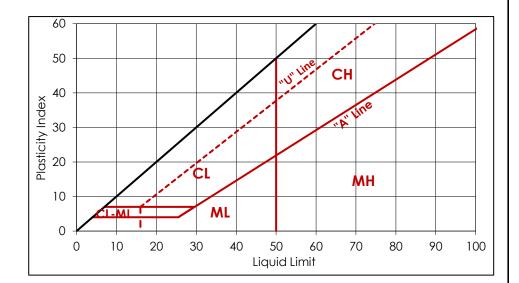
CLIENT FIELD ID BH-12, 700 mm

23

2944 STANTEC SAMPLE NO.

TRIAL MC (%) PLASTIC LIMIT 2 LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI AS REC'D MC (%)

25 66 31.78



COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba R3E 3P1

PROJECT NO.

123316853

ATTN

Richard Weibel

REPORT NO. 10

DATE SAMPLED: 2024.Jan.17

DATE RECEIVED: 2024.Jan.17

TRIAL

MC (%)

DATE TESTED: 2024.Jan.31

SAMPLED BY:

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

BH-13, 650 mm CLIENT FIELD ID

2998 STANTEC SAMPLE NO.

2

18

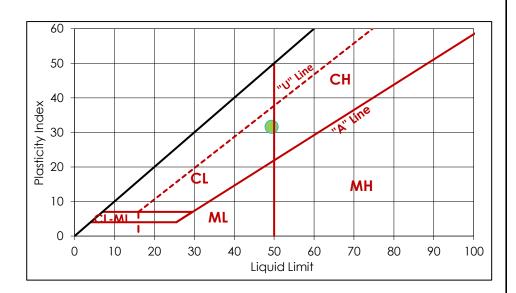
PLASTIC LIMIT

LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI

AS REC'D MC (%)

18 32 29.20

LIQUID LIMIT TRIAL 2 28 **BLOWS** MC (%)



COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1 PROJECT NO.

Richard Weibel **ATTN** REPORT NO.

DATE SAMPLED: 2024.Jan.08 DATE RECEIVED: 2024.Jan.08 DATE TESTED: 2024.Jan.15 Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. Blair Dawson SAMPLED BY: TESTED BY:

MATERIAL IDENTIFICATION

TRIAL

BLOWS

MC (%)

CLIENT FIELD ID BH-14, 650 mm

2945 STANTEC SAMPLE NO.

123316853

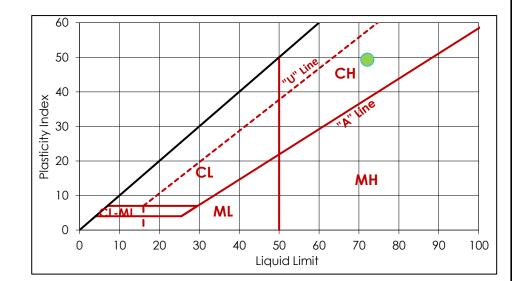
11

LIQUID LIMIT 2 21 76

PLASTIC LIMIT **TRIAL** 2 MC (%)

LIQUID LIMIT, LL PLASTIC LIMIT, PL PLASTICITY INDEX, PI AS REC'D MC (%)

23 49 26.28



COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D4318 - LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX OF SOILS (LL METHOD B - ONE-POINT)

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

PROJECT NO.

123316853

12

ATTN

R3E 3P1

Richard Weibel

REPORT NO.

DATE SAMPLED: 2024.Jan.17

DATE RECEIVED: 2024.Jan.17

TRIAL

MC (%)

DATE TESTED: 2024.Jan.31

SAMPLED BY:

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-15, 650 mm

2999 STANTEC SAMPLE NO.

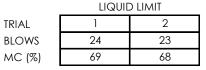
PLASTIC LIMIT

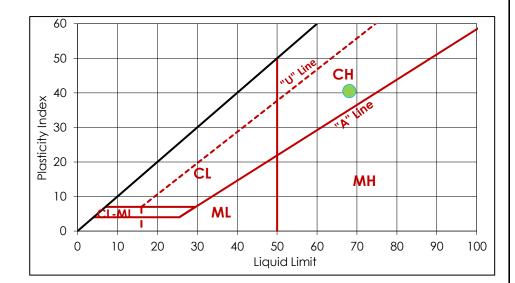
2

LIQUID LIMIT, LL PLASTIC LIMIT, PL

PLASTICITY INDEX, PI AS REC'D MC (%)

28 40 31.80





COMMENTS No comments.

2024.Feb.05 REPORT DATE

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



Stantec 199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba R3F 3P1

PROJECT NO.

123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.15

DATE RECEIVED: 2024. Jan. 15

DATE TESTED: 2024.Jan.23

SAMPLED BY: Stantec Consulting Ltd.

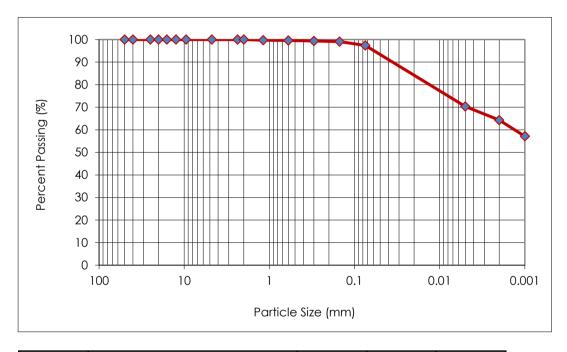
SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-01, 1000 mm STANTEC SAMPLE NO. 2972

1



Sieve Size (mm)	% Passing
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	100.0
2.00	100.0
1.18	99.7
0.600	99.6
0.300	99.4
0.150	99.1
0.075	97.4
0.005	70.4
0.002	64.3
0.001	57.1

Gravel		Sand		Silt	Clay	Colloids		
Glavei	Coarse	Medium	Fine	SIII	Cluy	Colloids		
0.0	0.0	0.5	2.1	33.1	64.3	57.1		

COMMENTS

No comments.

REPORT DATE 2024.Jan.25

Guillaume Beauce, P.Eng. **REVIEWED BY**

Geotechnical Engineer - Materials Testing Services



Stantec 199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

123316853 PROJECT NO.

Richard Weibel **ATTN** REPORT NO.

DATE SAMPLED: 2024.Jan.15 DATE RECEIVED: 2024. Jan. 15 DATE TESTED: 2024.Jan.23 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-02, 1000 mm STANTEC SAMPLE NO. 2973

	100	***	◇			
	90					
	80					
(%)	70					
ing	60					
Percent Passing (%)	50					
ent	40					
eľc	30					
₾.	20 #####					
	10					
	0					
	100	10	1	0.1	0.01	0.001
			Particle Siz	e (mm)		

Sieve Size (mm)	% Passing
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	100.0
2.00	100.0
1.18	100.0
0.600	99.9
0.300	99.8
0.150	99.6
0.075	97.9
0.005	61.1
0.002	47.8
0.001	42.8

Gravel		Sand		Silt	Clay	Colloids
Glavel	Coarse	Medium	Fine	SIII	Clay	Colloids
0.0	0.0	0.1	2.0	50.1	47.8	42.8

COMMENTS

No comments.

REPORT DATE 2024.Jan.25

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

PROJECT NO.

123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.15 SAMPLED BY:

Stantec Consulting Ltd.

DATE RECEIVED: 2024. Jan. 15

DATE TESTED: 2024.Jan.23

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Larry Presado

Sieve Size

(mm) 50.0

40.0

25.0

20.0

16.0

12.5

9.5

4.75

2.36

2.00

1.18

0.600

0.300

0.150

0.075 0.005

0.002

0.001

% Passina

100.0

100.0

100.0

100.0

100.0

100.0

100.0

100.0

100.0

100.0

100.0

100.0

100.0

99.9 99.8

81.1

78.4 78.4

MATERIAL IDENTIFICATION

CLIENT FIELD ID

BH-03, 1000 mm

STANTEC SAMPLE NO. 2974

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	90					
	80					
<u>%</u>	70					
Percent Passing (%)	60					
Pass	50					
ent	40					
erc	30					
ш	20					
	10					
	0					
	100	10	1	0.1	0.01	0.001
			Particle Siz	ze (mm)		

Gravel		Sand		Silt	Clay	Colloids	
Glavei	Coarse	Medium	Fine	3111	Cluy	Colloids	
0.0	0.0	0.0	0.2	21.4	78.4	78.4	

COMMENTS

No comments.

REPORT DATE 2024.Jan.25 **REVIEWED BY**

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



Stantec 199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

123316853 PROJECT NO.

Richard Weibel **ATTN** REPORT NO.

DATE SAMPLED: 2024.Jan.08 DATE RECEIVED: 2024. Jan. 08 DATE TESTED: 2024.Jan.10 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-04, 1000 mm STANTEC SAMPLE NO. 2941

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8	70				#	Ш		Н		#	Н	$^{+}$	+	-	#	Н	\mathbb{H}	+				_	-		$\overline{}$
ng	60				\parallel					\perp	Ш		-		4		\coprod	-		\parallel		\perp			_
Percent Passing (%)	50 #									1															_
ant F	40 #				Ш	Ш											Ш								4
ərce	30 #																								_
ď	20 #				Ш												Ш								
	10				Ш											Ш									
	0				Ш																				
	100)			10					1					0.1				C	0.01	l			0	.001
									Po	art	icl	e Si	ze	(mn	∩)										

Sieve Size (mm)	% Passing				
50.0	100.0				
40.0	100.0				
25.0	100.0				
20.0	100.0				
16.0	100.0				
12.5	100.0				
9.5	100.0				
4.75	99.9				
2.36	99.8				
2.00	99.7				
1.18	99.4				
0.600	99.1				
0.300	98.9				
0.150	98.8				
0.075	98.4				
0.005	81.3				
0.002	77.7				
0.001	76.3				

Gravel		Sand		Silt	Clay	Colloids
Glavei	Coarse	Medium	Fine	3111	Cluy	Colloids
0.1	0.2	0.7	0.6	20.7	77.7	76.3

COMMENTS

No comments.

REPORT DATE 2024.Jan.15

REVIEWED BY

Geotechnical Engineer - Materials Testing Services

Guillaume Beauce, P.Eng.



Stantec 199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

PROJECT NO.

123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.15

DATE RECEIVED: 2024. Jan. 15

DATE TESTED: 2024.Jan.23

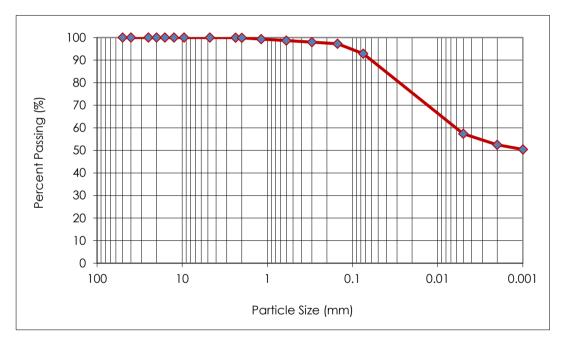
SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-08, 640 mm STANTEC SAMPLE NO. 2996



Sieve Size (mm)	% Passing
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	99.9
2.00	99.9
1.18	99.3
0.600	98.7
0.300	97.9
0.150	97.2
0.075	92.9
0.005	57.4
0.002	52.5
0.001	50.4

Gravel		Sand	Silt	Clay	Colloids	
Glavei	Coarse	Medium	Fine	SIII	Clay	Colloids
0.0	0.1	1.7	5.3	40.4	52.5	50.4

COMMENTS

No comments.

REPORT DATE

2024.Jan.25

REVIEWED BY Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



Stantec 199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3F 3P1

PROJECT NO. 123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.15

DATE RECEIVED: 2024. Jan. 15

DATE TESTED: 2024.Jan.23

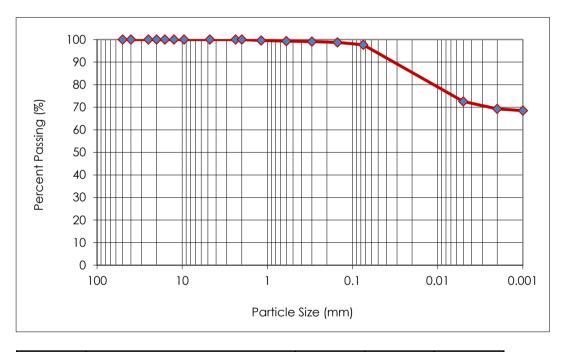
SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-09, 640 mm STANTEC SAMPLE NO. 2997



Sieve Size (mm)	% Passing
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	100.0
2.00	100.0
1.18	99.6
0.600	99.3
0.300	99.1
0.150	98.7
0.075	97.7
0.005	72.5
0.002	69.3
0.001	68.5

Gravel	Cravel				Clay	Colloids
Giavei	Coarse	Medium	Fine	Silt	Cluy	Colloids
0.0	0.0	0.8	1.5	28.4	69.3	68.5

COMMENTS

No comments.

REPORT DATE 2024.Jan.25 **REVIEWED BY**

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



Stantec 199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3F 3P1

PROJECT NO. 123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.08

DATE RECEIVED: 2024. Jan. 08

DATE TESTED: 2024.Jan.10

SAMPLED BY: Stantec Consulting Ltd.

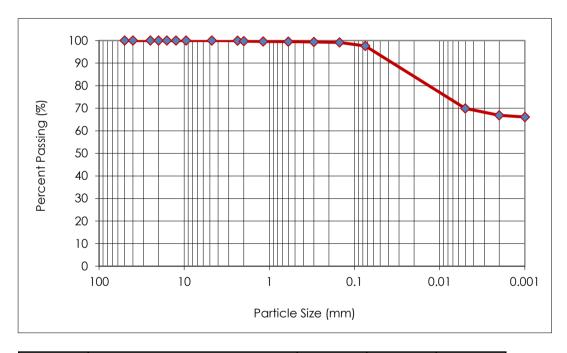
SUBMITTED BY: Stantec Consulting Ltd.

Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-10, 650 mm STANTEC SAMPLE NO. 2942

7



9

Gravel	Sand				Clay	Colloids
Glavei	Coarse	Medium	Fine	Silt	Cluy	Colloids
0.0	0.2	0.4	1.8	30.7	66.9	66.1

COMMENTS

No comments.

REPORT DATE 2024.Jan.15

Geotechnical Engineer - Materials Testing Services

Guillaume Beauce, P.Eng.

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided on written request. The data presented is for sole use of client stipulated above. Stantec is not responsible, nor can be held liable, for the use of this report by any other party, with or without the knowledge of Stantec.

REVIEWED BY



Stantec 199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Department

PROJECT

REPORT NO.

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

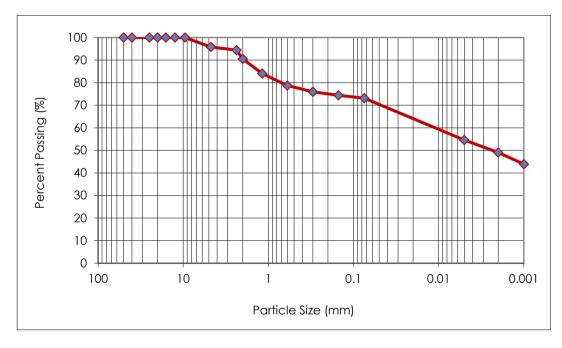
PROJECT NO. 123316853

Richard Weibel **ATTN**

DATE SAMPLED: 2024.Jan.08 DATE RECEIVED: 2024. Jan. 08 DATE TESTED: 2024.Jan.10 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-11, 650 mm STANTEC SAMPLE NO. 2943



Sieve Size (mm)	% Passing
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	95.8
2.36	94.4
2.00	90.5
1.18	84.1
0.600	78.7
0.300	75.9
0.150	74.4
0.075	73.1
0.005	54.6
0.002	49.1
0.001	43.9

Gravel	Sand				Clay	Colloids
Glavei	Coarse	Medium	Fine	Silt	Cluy	Colloids
4.2	5.3	13.4	4.0	24.0	49.1	43.9

COMMENTS

No comments.

REPORT DATE 2024.Jan.15

REVIEWED BY

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



Stantec 199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3F 3P1

PROJECT NO. 123316853

Richard Weibel **ATTN**

REPORT NO.

DATE SAMPLED: 2024.Jan.08

DATE RECEIVED: 2024. Jan. 08

DATE TESTED: 2024.Jan.10

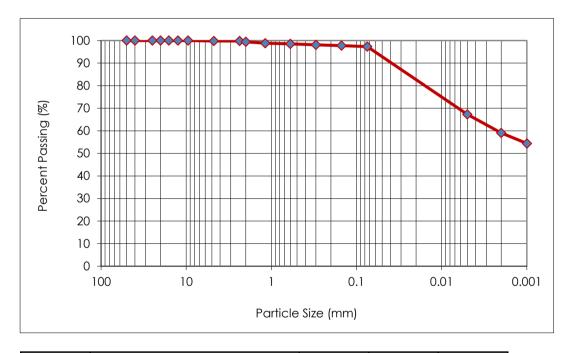
SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

Larry Presado TESTED BY:

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-12, 700 mm STANTEC SAMPLE NO. 2944



% Passing
100.0
100.0
100.0
100.0
100.0
100.0
100.0
99.9
99.8
99.5
98.8
98.5
98.1
97.8
97.3
67.3
59.1
54.4

Gravel	Gravel				Clay	Colloids
Giavei	Coarse	Medium	Fine	Silt	Cidy	Colloids
0.1	0.4	1.2	1.0	38.2	59.1	54.4

COMMENTS

No comments.

REVIEWED BY

Geotechnical Engineer - Materials Testing Services

Guillaume Beauce, P.Eng. REPORT DATE 2024.Jan.15



Stantec 199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba R3F 3P1

PROJECT NO.

123316853

Richard Weibel **ATTN**

10 REPORT NO.

DATE SAMPLED: 2024.Jan.15

DATE RECEIVED: 2024. Jan. 15

DATE TESTED: 2024.Jan.23

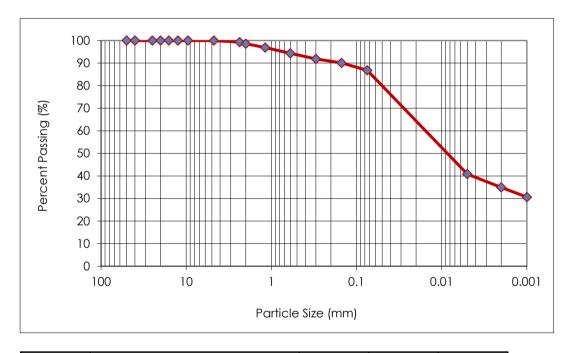
SAMPLED BY: Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-13, 640 mm STANTEC SAMPLE NO. 2998



Sieve Size (mm)	% Passing
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	100.0
2.36	99.3
2.00	98.6
1.18	96.9
0.600	94.3
0.300	91.9
0.150	90.1
0.075	86.9
0.005	40.9
0.002	34.9
0.001	30.6

Gravel	Sand				Clay	Colloids
Glavei	Coarse	Medium	dium Fine Silt	3111	Cidy	Colloids
0.0	1.4	5.7	6.0	52.0	34.9	30.6

COMMENTS

No comments.

REPORT DATE 2024.Jan.25

REVIEWED BY

Geotechnical Engineer - Materials Testing Services

Guillaume Beauce, P.Eng.



Stantec 199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3E 3P1

PROJECT NO.

123316853

Richard Weibel **ATTN**

REPORT NO. 11

DATE SAMPLED: 2024.Jan.08

SAMPLED BY: Stantec Consulting Ltd.

DATE RECEIVED: 2024. Jan. 08

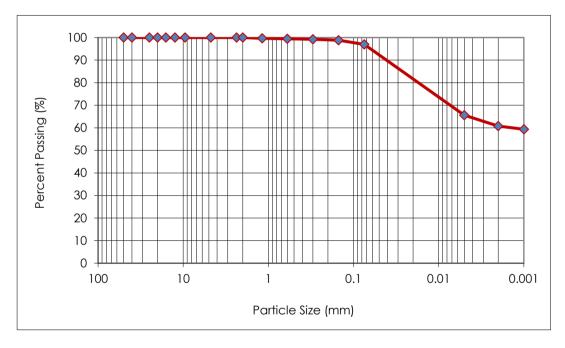
DATE TESTED: 2024.Jan.10

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-14, 650 mm STANTEC SAMPLE NO. 2945



Sieve Size (mm)	% Passing		
50.0	100.0		
40.0	100.0		
25.0	100.0		
20.0	100.0		
16.0	100.0		
12.5	100.0		
9.5	100.0		
4.75	100.0		
2.36	100.0		
2.00	100.0		
1.18	99.7		
0.600	99.5		
0.300	99.2		
0.150	98.8		
0.075	97.0		
0.005	65.6		
0.002	8.06		
0.001	59.4		

Gravel		Sand		Silt	Clay	Colloids
Glavel	Coarse	Medium	Fine	SIII	Clay	Colloids
0.0	0.0	0.7	2.3	36.2	60.8	59.4

COMMENTS

No comments.

REPORT DATE 2024.Jan.15 **REVIEWED BY**

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services



Stantec 199 Henlow Bay, Winnipeg, MB R3Y 1G4 Tel: (204) 488-6999



ASTM D7928 - PARTICLE-SIZE DISTRIBUTION OF FINE-GRAINED SOILS USING THE SEDIMENTATION ANALYSIS

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals Program

104 - 1155 Pacific Avenue

Winnipeg, Manitoba

R3F 3P1

PROJECT NO. 123316853

Richard Weibel **ATTN**

12 REPORT NO.

DATE SAMPLED: 2024.Jan.15 SAMPLED BY: Stantec Consulting Ltd. DATE RECEIVED: 2024. Jan. 15

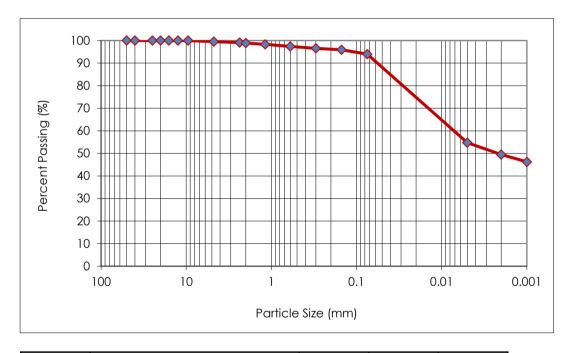
DATE TESTED: 2024.Jan.23

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY: Larry Presado

MATERIAL IDENTIFICATION

CLIENT FIELD ID BH-15, 640 mm STANTEC SAMPLE NO. 2999



Sieve Size (mm)	% Passing
50.0	100.0
40.0	100.0
25.0	100.0
20.0	100.0
16.0	100.0
12.5	100.0
9.5	100.0
4.75	99.5
2.36	99.1
2.00	98.9
1.18	98.3
0.600	97.4
0.300	96.6
0.150	95.9
0.075	94.0
0.005	54.7
0.002	49.5
0.001	46.2

Gravel		Sand		Silt	Clay	Colloids
Glavei	Coarse	Medium	Fine			
0.5	0.6	2.0	2.9	44.5	49.5	46.2

COMMENTS

No comments.

REPORT DATE 2024.Jan.25 **REVIEWED BY**

Guillaume Beauce, P.Eng.

Geotechnical Engineer - Materials Testing Services





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel PROJECT 2024 Local Street Renewals Program

PROJECT NO.

123316853-1 - Contract 1

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.15 2024.Jan.15 DATE TESTED 2024.Jan.24

INSITU MOISTURE 51.1 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Clay

DESCRIPTION SUPPLIER Existing Materials

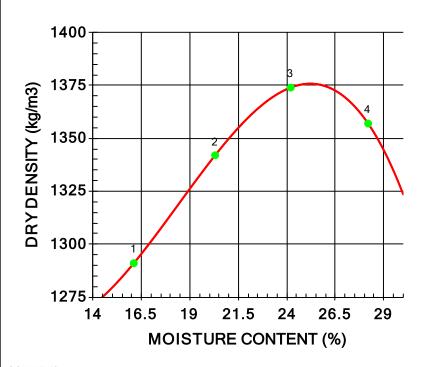
SOURCE Brock Street - BH-01, 1 m

D698

COMPACTION PROCEDURE A: 101.6mm Mold,

Passing 4.75mm

RAMMER TYPE Manual **PREPARATION** Moist OVERSIZE CORRECTION METHOD None RETAINED 4.75mm SCREEN N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1499	1291	16.1
2	1614	1342	20.3
3	1707	1374	24.2
4	1740	1357	28.2

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1380	25.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2972.

Page 1 of 1 2024.Jan.25

Stantec Consulting Ltd.

REVIEWED BY:





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.24 2024.Jan.15 2024.Jan.15 DATE TESTED

INSITU MOISTURE 43.3 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Clay

DESCRIPTION SUPPLIER Existing Materials

Brock Street - BH-02, 1 m SOURCE

COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION**

OVERSIZE CORRECTION METHOD RETAINED 4.75mm SCREEN

D698

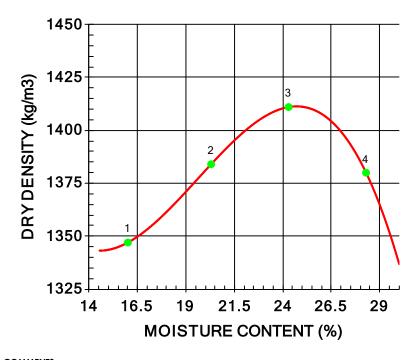
A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

None

N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1563	1347	16.0
2	1665	1384	20.3
3	1754	1411	24.3
4	1771	1380	28.3

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1410	24.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2973.

Page 1 of 1

2024.Jan.25

Stantec Consulting Ltd.

REVIEWED BY:





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.15 2024.Jan.15 DATE TESTED 2024.Jan.24

INSITU MOISTURE 44.0 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Clay

DESCRIPTION

SUPPLIER Existing Materials Brock Street - BH-03, 1 m SOURCE

COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD

A: 101.6mm Mold,

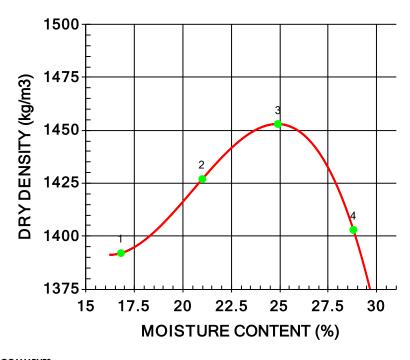
Passing 4.75mm

Manual Moist

D698

None

RETAINED 4.75mm SCREEN N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1626	1392	16.8
2	1727	1427	21.0
3	1815	1453	24.9
4	1807	1403	28.8

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1450	25.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2974.

Page 1 of 1 2024.Jan.25 Stantec Consulting Ltd. REVIEWED BY:

Jason Thompson, C.E.T.





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel PROJECT 2024 Local Street Renewals Program

PROJECT NO.

123316853-1 - Contract 1

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.08 DATE TESTED 2024.Jan.11 2024.Jan.08

INSITU MOISTURE 44.4 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Ryan Bremner

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Clay

DESCRIPTION

SUPPLIER Existing Materials

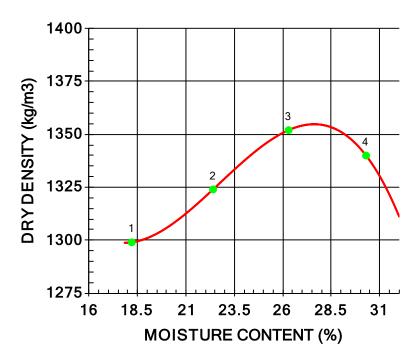
SOURCE Brock Street - BH-04, 1 m

COMPACTION PROCEDURE A: 101.6mm Mold,

Passing 4.75mm

D698

RAMMER TYPE Manual **PREPARATION** Moist OVERSIZE CORRECTION METHOD None RETAINED 4.75mm SCREEN N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	moisture Content (%)
1	1536	1299	18.2
2	1621	1324	22.4
3	1707	1352	26.3
4	1746	1340	30.3

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1360	27.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2941.

Page 1 of 1 REVIEWED BY: 2024.Jan.15 Stantec Consulting Ltd.





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.17 2024.Jan.17 DATE TESTED 2024.Feb.01

INSITU MOISTURE 40.7 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Pervez Safdar

MATERIAL IDENTIFICATION

Subgrade MAJOR COMPONENT

SIZE Clay **DESCRIPTION**

SUPPLIER Existing Materials SOURCE Edderton Ave - BH-08, 0.64 m

D698

COMPACTION PROCEDURE A: 101.6mm Mold,

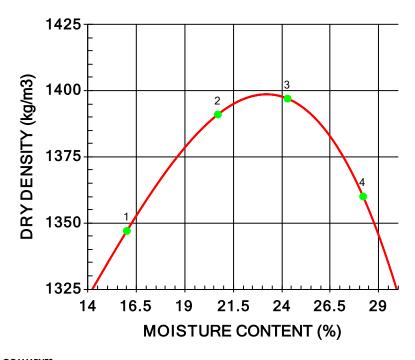
Passing 4.75mm

RAMMER TYPE Manual **PREPARATION** Moist OVERSIZE CORRECTION METHOD

None

RETAINED 4.75mm SCREEN

N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1562	1347	16.0
2	1679	1391	20.7
3	1737	1397	24.3
4	1743	1360	28.2

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1400	23.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2996.

2024.Feb.02 REVIEWED BY: Page 1 of 1 Stantec Consulting Ltd.





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.17 2024.Jan.17 DATE TESTED 2024.Feb.01

INSITU MOISTURE 46.4 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

Subgrade MAJOR COMPONENT

SIZE Clay **DESCRIPTION PREPARATION** SUPPLIER Existing Materials

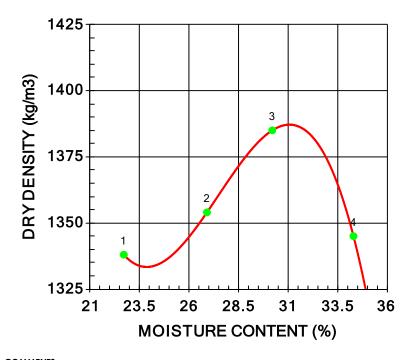
SOURCE Edderton Ave - BH-09, 0.64 m

D698

COMPACTION PROCEDURE A: 101.6mm Mold,

Passing 4.75mm

RAMMER TYPE Manual Moist OVERSIZE CORRECTION METHOD None RETAINED 4.75mm SCREEN N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1642	1338	22.7
2	1718	1354	26.9
3	1803	1385	30.2
4	1807	1345	34.3

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1390	31.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2997.

Page 1 of 1 2024.Feb.02 Stantec Consulting Ltd. REVIEWED BY:

Jason Thompson, C.E.T.





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

D698

Manual

Moist

None

N/A %

A: 101.6mm Mold,

Passing 4.75mm

PROJECT NO. 123316853-1 - Contract 1

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.11 2024.Jan.08 DATE TESTED 2024.Jan.08

INSITU MOISTURE 42.5 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Ryan Bremner

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Clay

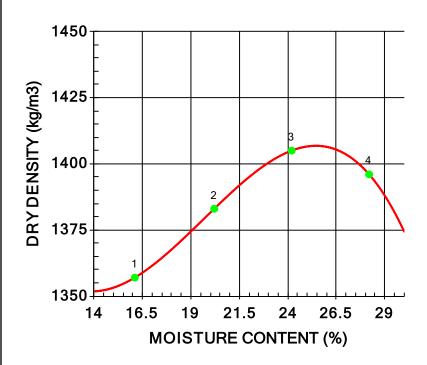
DESCRIPTION SUPPLIER Existing Materials

SOURCE Edderton Ave - BH-10, 0.65 m

COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD

RETAINED 4.75mm SCREEN



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1575	1357	16.1
2	1662	1383	20.2
3	1745	1405	24.2
4	1790	1396	28.2

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1410	25.5
OVERSIZE CORRECTED		

COMMENTS

Page 1 of 1

Stantec Sample No. 2942.

2024.Jan.15

Stantec Consulting Ltd.

REVIEWED BY:

Jason Thompson, C.E.T.





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.08 DATE TESTED 2024.Jan.12 2024.Jan.08

INSITU MOISTURE 34.0 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Madison Murphy

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Clay

DESCRIPTION SUPPLIER

Existing Materials SOURCE Edderton Ave - BH-11, 0.65 m

COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION**

OVERSIZE CORRECTION METHOD RETAINED 4.75mm SCREEN

D698

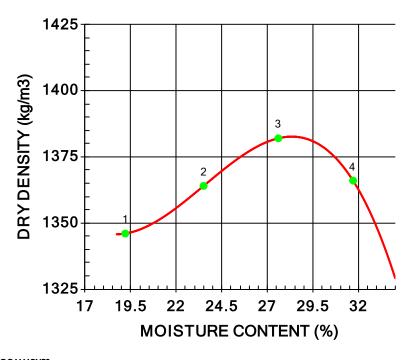
A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

None

N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1604	1346	19.2
2	1685	1364	23.5
3	1764	1382	27.6
4	1799	1366	31.7

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1380	28.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2943.

Page 1 of 1 REVIEWED BY: 2024.Jan.15 Stantec Consulting Ltd. Jason Thompson, C.E.T.





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.11 2024.Jan.08 DATE TESTED 2024.Jan.08

INSITU MOISTURE 35.7 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Ryan Bremner

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Clay

DESCRIPTION

SUPPLIER Existing Materials

SOURCE Rosemount Ave - BH-12, 0.70 m

COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD

RETAINED 4.75mm SCREEN

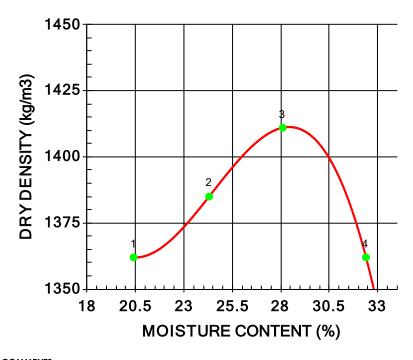
D698

A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

None N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1640	1362	20.4
2	1721	1385	24.3
3	1808	1411	28.1
4	1803	1362	32.4

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1410	28.5
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2944.

Page 1 of 1 2024.Jan.15 Stantec Consulting Ltd. REVIEWED BY:





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.17 2024.Jan.17 DATE TESTED 2024.Feb.01 10

INSITU MOISTURE 44.3 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Donald Eliazar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Subgrade

SIZE Clay **DESCRIPTION**

SUPPLIER Existing Materials

SOURCE Rosemount Ave - BH-13, 0.65 m

COMPACTION PROCEDURE

RETAINED 4.75mm SCREEN

RAMMER TYPE **PREPARATION** OVERSIZE CORRECTION METHOD

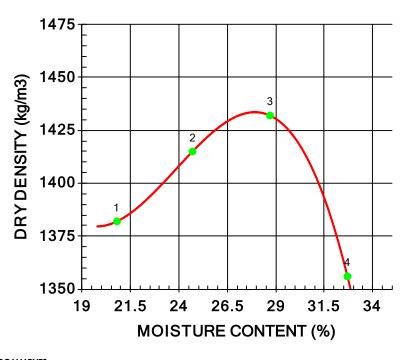
D698

A: 101.6mm Mold,

Passing 4.75mm

Manual Moist

None N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1670	1382	20.8
2	1765	1415	24.7
3	1843	1432	28.7
4	1799	1356	32.7

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1430	28.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2998.

Page 1 of 1

2024.Feb.02

Stantec Consulting Ltd.

REVIEWED BY:

Jason Thompson, C.E.T.





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1

CLIENT City of Winnipeg

ATTN: Richard Weibel

PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1

PROCTOR NO. DATE SAMPLED DATE RECEIVED 2024.Jan.08 DATE TESTED 2024.Jan.12 2024.Jan.08

INSITU MOISTURE 27.8 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Madison Murphy

MATERIAL IDENTIFICATION

MAJOR COMPONENT Backfill

SIZE Clay

DESCRIPTION

SUPPLIER Existing Materials

SOURCE Rosemount Ave - BH-14, 0.65 m

COMPACTION PROCEDURE

RAMMER TYPE **PREPARATION**

OVERSIZE CORRECTION METHOD RETAINED 4.75mm SCREEN

D698

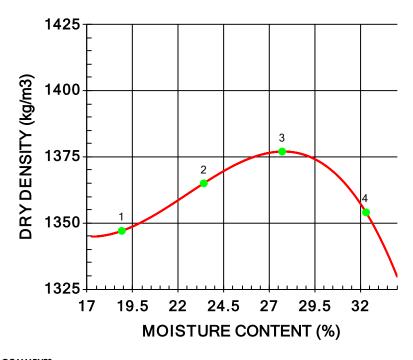
A: 101.6mm Mold,

Passing 4.75mm

Automatic

Moist None

N/A %



TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)
1	1601	1347	18.9
2	1685	1365	23.4
3	1759	1377	27.7
4	1792	1354	32.3

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1380	28.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2945.

Page 1 of 1

2024.Jan.15

Stantec Consulting Ltd.

REVIEWED BY:

Jason Thompson, C.E.T.





PROCTOR TEST REPORT

City of Winnipeg 104 - 1155 Pacific Ave. Winnipeg, MB R3E 2P1 CLIENT City of Winnipeg C.C.

ATTN: Richard Weibel PROJECT 2024 Local Street Renewals Program

PROJECT NO. 123316853-1 - Contract 1

PROCTOR NO. 12 DATE SAMPLED 2024.Jan.17 DATE RECEIVED 2024.Jan.17 DATE TESTED 2024.Feb.01

COMPACTION PROCEDURE

RETAINED 4.75mm SCREEN

INSITU MOISTURE 41.0 % COMPACTION STANDARD Standard Proctor, ASTM

TESTED BY Pervez Safdar

MATERIAL IDENTIFICATION

MAJOR COMPONENT Subgrade

 SIZE
 Clay
 RAMMER TYPE
 Manual

 DESCRIPTION
 PREPARATION
 Moist

 SUPPLIER
 Existing Materials
 OVERSIZE CORRECTION METHOD
 None

SOURCE Rosemount Ave - BH-15, 0.65 m

	1500-						
		-					
	1475-	-					
/m3	1470	-			3		
S	1450-	-					4
Ţ	1450-	-					
DRY DENSITY (kg/m3)	1425-	-		2			
, DE	1425	-		1			
ЯY	1 100	-					\
Ц	1400	- 1					
		-					
	1375						
	1	5 17	'.5 2	0 22	2.5 2	5 27	'.5 30
	MOISTURE CONTENT (%)						

TRIAL NUMBER	WET DENSITY (kg/m³)	DRY DENSITY (kg/m³)	MOISTURE CONTENT (%)	
1	1616	1384	16.8	
2	1717	1421	20.8	
3	1831	1466	24.9	
4	1866	1448	28.9	

D698

N/A %

A: 101.6mm Mold,

Passing 4.75mm

	MAXIMUM DRY DENSITY (kg/m³)	OPTIMUM MOISTURE CONTENT (%)
CALCULATED	1470	26.0
OVERSIZE CORRECTED		

COMMENTS

Stantec Sample No. 2999.

Page 1 of 1 2024.Feb.02 Stantec Consulting Ltd. REVIEWED BY: Jason Thompson, C.E.T.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg **PROJECT** 2024 Local Street Renewals

Program - Contract 1

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

Richard Weibel **ATTN** REPORT NO. 1

DATE SAMPLED: 2024.Jan.15 DATE RECEIVED: 2024.Jan.15 DATE TESTED: 2024.Jan.29 Donald Eliazar Ryan Bremner SUBMITTED BY: Ryan Bremner **TESTED BY:** SAMPLED BY:

MATERIAL IDENTIFICATION

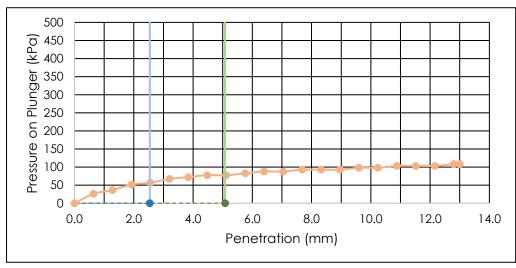
Existing Material MATERIAL USE Subgrade **SUPPLIER** 4.75 mm Existing Material MAX. NOMINAL SIZE **SOURCE** MATERIAL TYPE Clay BH-01, 1.000m SAMPLE LOCATION

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2972

96 ± 2 hr **IMMERSION PERIOD** TARGET MAX. DRY DENSITY 1380 kg/m³ Soaked 25.0 % CONDITION OF SAMPLE TARGET OPTIMUM MOISTURE

SURCHARGE MASS 4.54 kg

 1310 kg/m^3 +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 25.1 % **SWELL OF SAMPLE** 0.10 % AS-COMPACTED MOISTURE POST-TEST MOISTURE 49.7 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 8.0

CBR VALUE AT 5.08 mm **PENETRATION** 8.0

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Feb.03 Jason Thompson, C.E.T.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals

Program - Contract 1

104 - 1155 Pacific Avenue Winnipea, Manitoba

PROJECT NO.

123316853

2

R3F 2P1

MATERIAL USE

MATERIAL TYPE

MAX. NOMINAL SIZE

IMMERSION PERIOD

CONDITION OF SAMPLE

Richard Weibel ATTN

REPORT NO.

DATE SAMPLED: 2024.Jan.15 DATE TESTED: 2024.Feb.03 DATE RECEIVED: 2024.Jan.15 Stantec Consulting Ltd. SAMPLED BY: SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Donald Eliazar

MATERIAL IDENTIFICATION

Subgrade Existing Material **SUPPLIER** 4.75 mm Existing Material **SOURCE** Silt and clay, with organics BH-02, 1.000 m SAMPLE LOCATION

SPECIFICATION ID Not Applicable

96 ± 2 hr

Soaked

STANTEC SAMPLE NO. 2973

TARGET MAX. DRY DENSITY 1410 kg/m³

TARGET OPTIMUM MOISTURE

24.5 %

4.54 kg SURCHARGE MASS

0 % AS-COMPACTED DRY DENSITY

AS-COMPACTED MOISTURE

24.6 %

SWELL OF SAMPLE

+19 mm OVERSIZE

10.02 %

95 %

 1338 kg/m^3

POST-TEST MOISTURE

55.4 %

AS-COMPACTED % COMPACTION

CBR VALUE AT 2.54 mm PENETRATION

0.7

CBR VALUE AT 5.08 mm **PENETRATION**

0.7

500 0 450 ¥ 400 Plunger 350 300 250 $^{\circ}$ 200 Pressure 150 100 50 0 0.0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 Penetration (mm)

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Feb.12 **REVIEWED BY** Jason Thompson, C.E.T.

Principal - Manager of Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals

Existing Material

Existing Material

Program - Contract 1

104 - 1155 Pacific Avenue Winnipea, Manitoba

PROJECT NO.

123316853

R3E 2P1

ATTN

Subgrade

4.75 mm

123316633

3

MATERIAL USE

MATERIAL IDENTIFICATION

MAX. NOMINAL SIZE

Richard Weibel

REPORT NO.

SUPPLIER

SOURCE

DATE SAMPLED: 2024.Jan.15 DATE RECEIVED: 2024.Jan.15 DATE TESTED: 2024.Feb.02 SAMPLED BY: Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. TESTED BY: Donald Eliazar

BH-03, 1.000 m MATERIAL TYPE Silty Clay SAMPLE LOCATION SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2974 IMMERSION PERIOD 96 ± 2 hr TARGET MAX. DRY DENSITY Soaked TARGET OPTIMUM MOISTURE CONDITION OF SAMPLE 4.54 kg SURCHARGE MASS +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY **SWELL OF SAMPLE** 8.16 % AS-COMPACTED MOISTURE POST-TEST MOISTURE 47.8 % AS-COMPACTED % COMPACTION 500 0 450 ¥ 400 Plunger 350 300 250 $^{\circ}$ 200 Pressure 150 100 50 0 0.0 2.0 4.0 6.0 8.0 10.0 12.0 14.0

CBR VALUE AT 2.54 mm PENETRATION 1.1

1450 kg/m³

 1375 kg/m^3

25.0 %

25.1 %

95 %

CBR VALUE AT 5.08 mm PENETRATION 1.0

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

Penetration (mm)

REPORT DATE 2024.Feb.12

REVIEWED BY Jason Thompson, C.E.T.

Principal - Manager of Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg PROJECT 2024 Local Street Renewals

Program - Contract 1

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 4

DATE SAMPLED: 2024.Jan.08 DATE RECEIVED: 2024.Jan.08 DATE TESTED: 2024.Jan.16
SAMPLED BY: Graeme Patrick TESTED BY: Madison Murphy

MATERIAL IDENTIFICATION

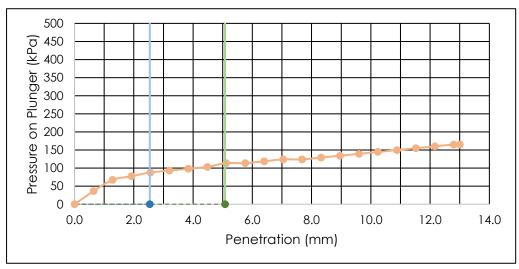
MATERIAL USE Subgrade SUPPLIER Existing Material MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material MATERIAL TYPE Silty Clay SAMPLE LOCATION BH-04, 1.000 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2941

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1360 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE27.5 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1293 kg/m 3 SWELL OF SAMPLE 0.05 % AS-COMPACTED MOISTURE 27.6 % POST-TEST MOISTURE 39.5 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 1.3

CBR VALUE AT 5.08 mm PENETRATION 1.1

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Jan.22

REVIEWED BY / Jason Thompson, C.E.T.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg, Public Works Department

Subgrade

4.75 mm

Silty Clay

Not Applicable

PROJECT

2024 Local Street Renewals

Existing Material

Existing Material

BH-08, 0.640 m

2996

104 - 1155 Pacific Avenue

Program - Contract 1

Winnipeg, Manitoba R3E 2P1

MATERIAL IDENTIFICATION

MAX. NOMINAL SIZE

MATERIAL USE

MATERIAL TYPE

SPECIFICATION ID

PROJECT NO.

123316853

ATTN

Richard Weibel

REPORT NO.

SUPPLIER

SOURCE

SAMPLE LOCATION

STANTEC SAMPLE NO.

5

DATE SAMPLED: 2024.Jan.17 DATE RECEIVED: 2024.Jan.17 DATE TESTED: 2024.Feb.12 Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. Donald Eliazar SAMPLED BY: TESTED BY:

96 ± 2 hr IMMERSION PERIOD TARGET MAX. DRY DENSITY Soaked CONDITION OF SAMPLE TARGET OPTIMUM MOISTURE SURCHARGE MASS 4.54 kg +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY **SWELL OF SAMPLE** 7.38 % AS-COMPACTED MOISTURE POST-TEST MOISTURE 47.1 % AS-COMPACTED % COMPACTION 500 (kPa) 450 400 Plunger 350 300 250 0 200 Pressure 150 100 50 0 8.0 2.0 4.0 6.0 10.0 12.0 14.0 Penetration (mm)

CBR VALUE AT 2.54 mm PENETRATION 1.2

1400 kg/m³

 1330 kg/m^3

23.0 %

23.1 %

95 %

CBR VALUE AT 5.08 mm PENETRATION 1.1

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Feb.20 **REVIEWED BY** Jason Thompson, C.E.T.

Principal - Manager of Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals

Program - Contract 1

104 - 1155 Pacific Avenue Winnipeg, Manitoba

PROJECT NO.

REPORT NO.

SUPPLIER

SOURCE

123316853

R3E 2P1

MATERIAL TYPE

SPECIFICATION ID

SURCHARGE MASS

+19 mm OVERSIZE

SWELL OF SAMPLE

DATE SAMPLED: 2024.Jan.17

DATE RECEIVED: 2024.Jan.17

DATE TESTED: 2024.Feb.15

SAMPLED BY:

ATTN

Richard Weibel

Stantec Consulting Ltd.

SUBMITTED BY: Stantec Consulting Ltd.

TESTED BY:

Donald Eliazar

MATERIAL IDENTIFICATION

MATERIAL USE Subgrade MAX. NOMINAL SIZE 4.75 mm

Clay

Not Applicable

SAMPLE LOCATION

Existing Material BH-09, 0.640 m

Existing Material

STANTEC SAMPLE NO. 2997

IMMERSION PERIOD

CONDITION OF SAMPLE

96 ± 2 hr

Soaked

4.54 kg

0 %

4.37 %

49.1 %

TARGET MAX. DRY DENSITY

TARGET OPTIMUM MOISTURE

AS-COMPACTED DRY DENSITY

AS-COMPACTED MOISTURE AS-COMPACTED % COMPACTION 1320 kg/m^3

31.0 %

1390 kg/m³

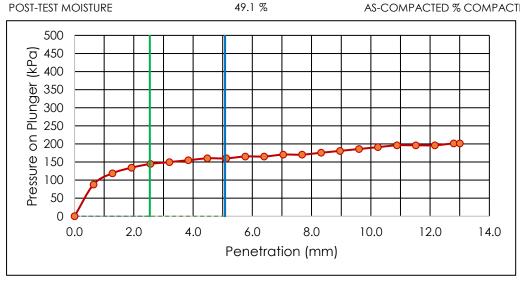
31.0 % 95 %

CBR VALUE AT 2.54 mm PENETRATION

2.1

CBR VALUE AT 5.08 mm **PENETRATION**

1.6



COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Feb.20 **REVIEWED BY**

Jason Thompson, C.E.T.

Principal - Manager of Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg PROJECT 2024 Local Street Renewals

Program - Contract 1

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 7

DATE SAMPLED: 2024.Jan.08 DATE RECEIVED: 2024.Jan.08 DATE TESTED: 2024.Jan.16
SAMPLED BY: Graeme Patrick TESTED BY: Madison Murphy

MATERIAL IDENTIFICATION

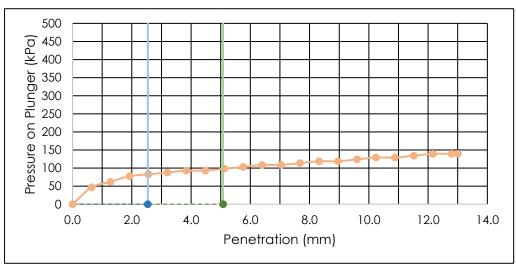
MATERIAL USESubgradeSUPPLIERExisting MaterialMAX. NOMINAL SIZE4.75 mmSOURCEExisting MaterialMATERIAL TYPESilty ClaySAMPLE LOCATIONBH-10, 0.650 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2942

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1410 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE25.5 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1340 kg/m 3 SWELL OF SAMPLE 0.04 % AS-COMPACTED MOISTURE 25.5 % POST-TEST MOISTURE 41.9 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 1.2

CBR VALUE AT 5.08 mm PENETRATION 1.0

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Jan.22

REVIEWED BY Jason Thompson, C.E.T.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg PROJECT 2024 Local Street Renewals

Program - Contract 1

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 8

DATE SAMPLED: 2024.Jan.08 DATE RECEIVED: 2024.Jan.08 DATE TESTED: 2024.Jan.16
SAMPLED BY: Graeme Patrick TESTED BY: Madison Murphy

MATERIAL IDENTIFICATION

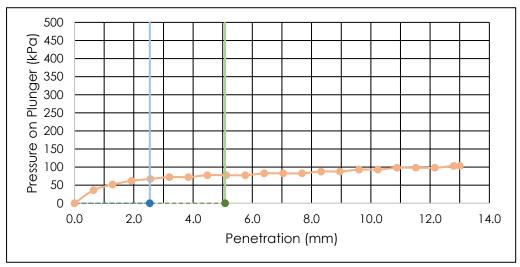
MATERIAL USE Subgrade SUPPLIER Existing Material MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material MATERIAL TYPE Clay SAMPLE LOCATION BH-11, 0.650m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2943

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1380 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE28.5 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1312 kg/m 3 SWELL OF SAMPLE 0.07 % AS-COMPACTED MOISTURE 28.5 % POST-TEST MOISTURE 44.9 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 1.0

CBR VALUE AT 5.08 mm PENETRATION 0.8

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Jan.22

REVIEWED BY Jason Thompson, C.E.T.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg **PROJECT** 2024 Local Street Renewals

Program - Contract 1

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

Richard Weibel 9 **ATTN** REPORT NO.

DATE SAMPLED: 2024.Jan.08 DATE RECEIVED: 2024.Jan.08 DATE TESTED: 2024.Jan.16 Graeme Patrick SUBMITTED BY: Graeme Patrick Madison Murphy SAMPLED BY: TESTED BY:

MATERIAL IDENTIFICATION

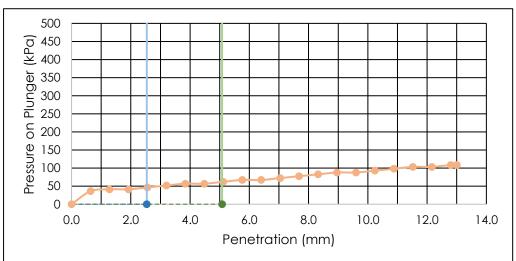
Existing Material MATERIAL USE Subgrade **SUPPLIER** 4.75 mm Existing Material MAX. NOMINAL SIZE **SOURCE** MATERIAL TYPE Clay BH-12, 0.700 m SAMPLE LOCATION

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2944

96 ± 2 hr **IMMERSION PERIOD** TARGET MAX. DRY DENSITY 1410 kg/m³ Soaked 28.5 % CONDITION OF SAMPLE TARGET OPTIMUM MOISTURE

SURCHARGE MASS 4.54 kg

 1339 kg/m^3 +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY **SWELL OF SAMPLE** 0.04 % AS-COMPACTED MOISTURE 28.6 % POST-TEST MOISTURE 39.8 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 0.7

CBR VALUE AT 5.08 mm **PENETRATION** 0.6

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Jan.22 **REVIEWED BY** Jason Thompson, C.E.T.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg, Public Works Department

Subgrade

Not Applicable

4.75 mm

Clay

PROJECT

2024 Local Street Renewals

Existing Material

Existing Material

BH-13, 0.650 m

2998

Program - Contract 1

104 - 1155 Pacific Avenue Winnipeg, Manitoba

R3E 2P1

PROJECT NO.

123316853

Richard Weibel ATTN

MATERIAL IDENTIFICATION

MAX. NOMINAL SIZE

MATERIAL USE

MATERIAL TYPE

SPECIFICATION ID

SUPPLIER

SOURCE

10 REPORT NO.

SAMPLE LOCATION

STANTEC SAMPLE NO.

DATE SAMPLED: 2024.Jan.17 DATE RECEIVED: 2024.Jan.17 DATE TESTED: 2024.Feb.15 Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. Donald Eliazar SAMPLED BY: TESTED BY:

96 ± 2 hr IMMERSION PERIOD TARGET MAX. DRY DENSITY Soaked CONDITION OF SAMPLE TARGET OPTIMUM MOISTURE SURCHARGE MASS 4.54 kg +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY **SWELL OF SAMPLE** 4.08 % AS-COMPACTED MOISTURE POST-TEST MOISTURE 43.5 % AS-COMPACTED % COMPACTION 500 (kPa) 450 400 Plunger 350 300 250 0 200 Pressure 150 100 50 0 8.0 2.0 4.0 6.0 10.0 12.0 14.0 Penetration (mm)

CBR VALUE AT 2.54 mm PENETRATION

2.0

1430 kg/m³

 1357 kg/m^3

28.0 %

28.1 %

95 %

CBR VALUE AT 5.08 mm **PENETRATION** 1.8

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Feb.20

Jason Thompson, C.E.T. **REVIEWED BY**

Principal - Manager of Materials Testing Services



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg PROJECT 2024 Local Street Renewals

Program - Contract 1

Winnipeg, MB

104-1155 Pacific Ave.

R3E 2P1 PROJECT NO. 123316853

ATTN Richard Weibel REPORT NO. 11

DATE SAMPLED: 2024.Jan.08 DATE RECEIVED: 2024.Jan.08 DATE TESTED: 2024.Jan.16
SAMPLED BY: Graeme Patrick TESTED BY: Madison Murphy

MATERIAL IDENTIFICATION

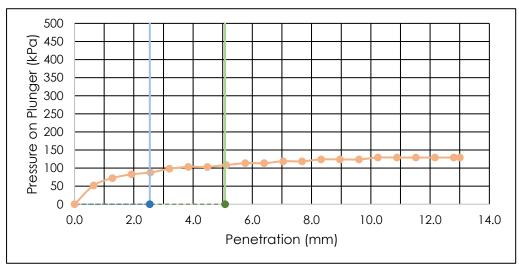
MATERIAL USE Subgrade SUPPLIER Existing Material MAX. NOMINAL SIZE 4.75 mm SOURCE Existing Material MATERIAL TYPE Clay SAMPLE LOCATION BH-14, 0.650 m

SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2945

IMMERSION PERIOD $96 \pm 2 \text{ hr}$ TARGET MAX. DRY DENSITY 1380 kg/m^3 CONDITION OF SAMPLESoakedTARGET OPTIMUM MOISTURE28.0 %

SURCHARGE MASS 4.54 kg

+19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 1306 kg/m 3 SWELL OF SAMPLE 0.05 % AS-COMPACTED MOISTURE 26.5 % POST-TEST MOISTURE 44.7 % AS-COMPACTED % COMPACTION 95 %



CBR VALUE AT 2.54 mm PENETRATION 1.3

CBR VALUE AT 5.08 mm PENETRATION 1.1

COMMENTS

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

REPORT DATE 2024.Jan.22

REVIEWED BY Jason Thompson, C.E.T.



199 Henlow Bay, Winnipeg, MB R3Y 1G4

Tel: (204) 488-6999



ASTM D1883 - CALIFORNIA BEARING RATIO (CBR) OF LABORATORY-COMPACTED SOILS

TO City of Winnipeg, Public Works Department

PROJECT

2024 Local Street Renewals

Program - Contract 1

104 - 1155 Pacific Avenue Winnipeg, Manitoba

PROJECT NO.

123316853

Richard Weibel

R3E 2P1

ATTN

REPORT NO. 12

DATE SAMPLED: 2024.Jan.17 DATE RECEIVED: 2024.Jan.17 DATE TESTED: 2024.Feb.15 Stantec Consulting Ltd. SUBMITTED BY: Stantec Consulting Ltd. Donald Eliazar SAMPLED BY: TESTED BY:

MATERIAL IDENTIFICATION Existing Material MATERIAL USE Subgrade **SUPPLIER** MAX. NOMINAL SIZE 4.75 mm Existing Material SOURCE MATERIAL TYPE Clay with silt BH-15, 0.650 m SAMPLE LOCATION SPECIFICATION ID Not Applicable STANTEC SAMPLE NO. 2999 $96 \pm 2 \text{ hr}$ IMMERSION PERIOD TARGET MAX. DRY DENSITY 1470 kg/m³ Soaked 26.0 % CONDITION OF SAMPLE TARGET OPTIMUM MOISTURE SURCHARGE MASS 4.54 kg 1396 kg/m^3 +19 mm OVERSIZE 0 % AS-COMPACTED DRY DENSITY 26.1 % **SWELL OF SAMPLE** 3.86 % AS-COMPACTED MOISTURE POST-TEST MOISTURE 41.0 % AS-COMPACTED % COMPACTION 95 % 500 **CBR VALUE AT 2.54 mm** (kPa) 450 PENETRATION 400 3.1 Plunger 350 300 CBR VALUE AT 5.08 mm 250 **PENETRATION** 0 2.4 200 Pressure 150 100 50

COMMENTS

0

0.0

2.0

4.0

Sample prepared to 95% of the maximum dry density at the optimum moisture content as determined from ASTM D698.

8.0

6.0

Penetration (mm)

REPORT DATE 2024.Feb.20 **REVIEWED BY** Jason Thompson, C.E.T.

14.0

Principal - Manager of Materials Testing Services

Reporting of these test results constitutes a testing service only. Engineering interpretation or evaluation of the test results is provided on written request. The data presented is for sole use of client stipulated above. Stantec is not responsible, nor can be held liable, for the use of this report by any other party, with or without the knowledge of Stantec.

10.0

12.0



Table 1 - Compressive Strength Test Data

Street	Core	Diameter	Length	L/D	Correction	Peak Load (kN)	Compressive Strength (MPa)	
	ID	(mm)	(mm)	Ratio	Factor		Measured	Corrected
Queenston Bay	BH-05	76.50	100.50	1.314	0.9372	311.00	67.67	63.42
Queenston Bay	BH-07	76.62	178.30	> 2.000	1.0000	293.92	63.76	63.76

TABLE - California Bearing Ratio (CBR) for Asphalt Pavement Reconstructions

Reference Standard Construction Specifications:

- (a) CW 3130, Clause 3.5 Supply and Installation of Geotextile Fabrics
- (b) CW 3135, Clause 3.3 Supply and Installation of Geogrid

Asphalt Pavement Reconstructions	CBR*
Brock Street from Mathers Avenue to Taylor Avenue	1.0
Rosemount Avenue from Beaumont Street to Derek Street	1.3
Edderton Avenue from Beaumont Street to Derek Street	1.3

^{*} CBR for calculating overlap of Geotextile rolls and Geogrid rolls.